

PRELIMINARY AMENDMENT

New U.S. National Stage Application to Toru SANO, et al.

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (original): A separation apparatus comprising:

a channel through which a sample flows;

a wall portion of said channel; and

a sample separation region provided to said channel;

wherein, in said sample separation region, said wall portion is provided with a capture portion capturing a specific component in said sample.

2. (original): The separation apparatus according to Claim 1, provided with a plurality of said capture portions.

3. (original): The separation apparatus according to Claim 1 or 2, wherein said capture portion is formed normal to the direction along which said channel extends, with a small width.

4. (currently amended): The separation apparatus according to ~~any one of~~ Claims 1-to-3, wherein said capture portion is formed so as to be narrowed in the opening width in a portion more distant from the center of said channel.

5. (currently amended): The separation apparatus according to ~~any one of~~ Claims 1-to-4, wherein said capture portion is a pocket portion provided to said wall portion.

6. (currently amended): The separation apparatus according to ~~any one of~~ Claims 1-to-5, comprising:

 said channel being formed on the surface of a substrate, and having an opening; and

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a lid covering said opening;

wherein said lid composes a part of said wall portion; and

a gap portion between said substrate and said lid composes said capture portion.

7. (original): The separation apparatus according to Claim 6, wherein said lid is provided with a pocket portion.

8. (currently amended): The separation apparatus according to ~~any one of Claims 1 to 7~~, wherein the surface of said wall portion has a convex curved surface with respect to said capture portion.

9. (currently amended): The separation apparatus according to ~~any one of Claims 1 to 7~~, wherein said wall portion has a concave curved surface with respect to said capture portion.

10. (currently amended): The separation apparatus according to ~~any one of Claims 1 to 9~~, wherein said channel has, formed in the channel on the downstream side of the channel, said capture portion larger than that formed in the channel on the upstream side of the channel.

11. (currently amended): The separation apparatus according to ~~any one of Claims 1 to 10~~, wherein said channel has, formed in the channel on the downstream side of the channel, said capture portion having an opening width wider than that of said capture portion formed in the channel on the upstream side of the channel.

12 (currently amended): The separation apparatus according to ~~any one of Claims 1 to 11~~, wherein said channel has, formed therein on the downstream side thereof, said capture portion having a depth smaller than that of said capture portion formed therein on the upstream side thereof.

13 (original): A separation apparatus comprising:

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a channel through which a sample flows;

a wall portion of said channel; and

a sample separation region provided to said channel;

wherein, in said sample separation region, said channel is provided with a plurality of expanded portions formed so as to have an expanded width as compared with the residual portion of said sample separation region.

14. (currently amended): The separation apparatus according to ~~any one of~~ Claims 1 to ~~or~~ 13, wherein said channel has the widened portions and narrowed portions alternately arranged along the direction of the sample flow.

15. (original): A separation apparatus comprising:

a channel through which a sample flows; and

a sample separation region provided to said channel;

wherein, in said sample separation region, said channel further comprises:

a partition wall;

a plurality of parallel channels divided by said partition wall; and

a plurality of capture portions, capturing a specific component in said sample, formed on said partition wall beside each of said plurality of parallel channels.

16. (original): The separation apparatus according to Claim 15, wherein said partition wall has, formed in said partition wall, a plurality of communication portions allowing said plurality of parallel channels to communicate with each other.

17. (currently amended): The separation apparatus according to any one of Claims 1, 13, or ~~15 to 16~~, wherein said sample separation region further comprises a width-wise external force

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imposing unit imposing an external force to said sample in the width-wise direction of said channel.

18. (original): A separation apparatus comprising:

a plurality of channel through which a sample flows;

a plurality of sample separation regions provided to said channels; and

an external force imposing unit imposing an external force to said sample in the longitudinal direction of said channels, to thereby make said sample travel through said plurality of channels at different flow rates.

19. (currently amended): The separation apparatus according to any one of Claims 1, 13, 15, ~~to or~~ 18, wherein said channel is a groove formed on the substrate,

and said separation apparatus further comprises:

a sample introduction unit introducing the sample into said channel;

a sample separation region provided to said channel, separating said sample into a plurality of components; and

a sample recovery unit analyzing or fractionating said separated sample separated by said sample separation region.

20 (currently amended): An analytical system detecting a specific component, comprising:

the separation apparatus described in any one of Claims 1, 13, 15, or ~~18 to 19~~; and

a detection unit detecting the specific component separated by said separation apparatus.

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21. (original): A method of fabricating a separation apparatus comprising a sample separation region in which a capture portion capturing a specific component of a sample is formed in a channel through which said sample flows, the method comprising:

forming on a substrate a groove which serves as said channel, and forming a plurality of pocket portions on said substrate in said groove; and

oxidizing the surface of said plurality of pocket portions so as to grow an oxide film on the surface of each of said pocket portions, to thereby form the capture portion.

22. (original): A method of fabricating a separation apparatus comprising a sample separation region in which a capture portion capturing a specific component of a sample is formed in a channel through which said sample flows, the method comprising:

forming on a substrate a plurality of columnar structures so as to be spaced from each other; and

oxidizing the side faces of said columnar structures so as to grow an oxide film on the side faces of said columnar structures, to thereby narrow the gap between the columnar structures and to form said capture portion.

23. (original): A method of fabricating a separation apparatus comprising a sample separation region in which a capture portion capturing a specific component of a sample is formed in a channel through which said sample flows, the method comprising:

forming a resist film on the surface of a substrate;

pressing a mold surface having an irregular profile formed thereon in contact with said resist film, to thereby transfer the irregular profile to the resist film;

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removing a portion of said resist film formed in the depressed portion of said irregular profile, to thereby form resist openings; and

etching said substrate through a mask composed of said resist film having said openings formed in said resist film, to thereby form said capture portion.

24. (original): A method of fabricating a separation apparatus comprising a sample separation region in which a capture portion capturing a specific component of a sample is formed in a channel through which said sample flows, the method comprising:

pressing a mold surface having an irregular profile formed on said mold structure in contact with a substrate composed of a resin material at least in the surficial portion of said mold structure, to thereby form said capture portion in said surficial portion.

25. (original): A method of fabricating a separation apparatus comprising a sample separation region in which a capture portion capturing a specific component of a sample is formed in a channel through which said sample flows, the method comprising:

forming on the surface of a substrate a groove which serves as said channel, and forming a pocket portions on the surface of said groove; and

providing a cover on said substrate in said sample separation region, to thereby form said capture portion in a gap between said pocket portion and said cover.

26. (original): The method of fabricating a separation apparatus according to any one of Claims 21 to 25, forming a plurality of said capture portions.